

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. Rejection of Claims 1-7, 10-16, 25-34, and 36-47 under 35 U.S.C. § 102(e).

Claims 1-7, 10-16, 25-34, and 36-47 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al., U.S. Patent Number 6,934,257 (hereinafter Liu).

After carefully considering the grounds for rejection, the Applicant responds as follows.

Claims 1, 2, 16, 30, and 36. Independent Claims 1, 2, 16, 30, and 36 have been amended to recite aspects of the invention with increased particularity.

In support of the rejection of these claims, it is asserted that Liu teaches aspects of the instant application, including *"means for optimizing data transfers as controlled from within said MAC layer by formatting network packets and performing partial packet retransmissions, and/or the suppression of unnecessary packet acknowledgments (see col. 3, lines 38-64 and col. 9, lines 39-55)."*

Applicant notes that the Liu reference is directed at a different purpose and to different operating principles than the present invention; for example, proposing a solution for TCP tunneling, while the instant application does not relate to TCP tunneling techniques. Consequently, it is not surprising that substantial structural differences exist between the Liu reference and the instant application. The claims have been amended to bring out these differences with increased particularity.

The independent claims in this group of claims have been amended to provide additional detail about adding bytes to the IP packets for the IEEE 802.11 transmissions, and the aspect relating to ACK suppression in Claims 1, 2, and 16 has been moved into dependent claims. In particular, the claims recite using these additional bytes under IEEE 802.11 for FEC and checksums and for performing partial packet retransmissions.

(a) Claim 1. Independent Claim 1 has been amended to recite “*means for optimizing data transfers as controlled from within said MAC layer by formatting network packets for IP transmission and then adding additional bytes for IEEE 802.11 transmission of FEC and checksums and performing partial packet retransmissions*”.

The teachings of Liu, however, provide no such provision for utilizing different packet sizes for IP and IEEE 802.11. Liu discusses the use of selective acknowledgements, but provides nothing with regard to enhancing the wireless communications and allowing easy data movement between IP and 802.11 transmissions.

Support for an anticipation rejection requires that every claim element must be taught or inherent in a single prior art reference, Manual of Patent Examining Procedure (MPEP) §706.02a. It is clear that the above claim is not anticipated by the relied-upon reference.

Therefore, because the teachings of Liu do not contain every element of amended independent Claim 1, Applicant respectfully requests that the rejection of Claim 1 and the claims that depend therefrom be withdrawn.

(b) Claim 2. Independent Claim 2 has been amended in a similar manner to Claim 1 to describe partial packet retransmission, which is recited as “*performing partial packet retransmission by dividing each IP packet into multiple data blocks and adding FEC or checksum information for the data blocks within extra bytes defined within the IEEE 802.11 frame which are not utilized in IP protocol frames, and retransmitting blocks by piggybacking them within said extra bytes within the IEEE 802.11 frame*”.

The teachings of Liu, however, provide no such provision for utilizing different packet sizes for IP and IEEE 802.11, and for the retransmitting of blocks by piggybacking them within the extra bytes from within the 802.11 frames. Liu teaches nothing in regard to enhancing the wireless communications and allowing easy movement between IP and 802.11 transmissions according to the recited structure.

Therefore, because the teachings of Liu do not contain every element of independent Claim 2, Applicant respectfully requests that the rejection of Claim 2 and the claims that depend therefrom be withdrawn.

(c) Claim 16. Independent method Claim 16 has been amended in a similar manner to independent Claims 1 and 2 to describe “a method of optimizing TCP/IP network data transfer over an IEEE 802.11 wireless network”, which includes “communicating over an IEEE 802.11 wireless standard between a sender and receiver according to a TCP/IP layered communication protocol” and “partially retransmitting untransmitted data blocks in said plurality of data blocks corresponding to the network packet frame by piggybacking them within extra bytes of space in a frame under the IEEE 802.11 wireless standard which are not available in the MTU size used with the IP protocol”.

The teachings of Liu provide no such provision for utilizing different packet sizes for IP and IEEE 802.11, and for partially retransmitting untransmitted data blocks in said plurality of data blocks by piggybacking them within the extra bytes within the 802.11 frames, which are not available within the given MTU size used with the IP protocol. Liu teaches nothing in this regard for enhancing the wireless communications and allowing easy movement between IP and 802.11 transmissions according to the recited structure.

Therefore, because the teachings of Liu do not contain every element of independent Claim 16, Applicant respectfully requests that the rejection of Claim 16 and the claims that depend therefrom be withdrawn.

(d) Claim 30. Independent Claim 30 has been amended in a similar manner to Claims 1, 2, and 16 to describe partial packet retransmission within a network data transfer optimization system that optimizes network packet communications between two non-identical networks. The network packet formatting unit is described for communicating between “a first network comprising a transport control protocol (TCP/IP) based network to a second network comprising an IEEE 802.11 wireless

network". In addition, a network packet suppression unit is attached which is "configured for deleting a number of unnecessary network acknowledgment packets belonging to the same connection and stored on the packet queue and corresponding to network packets transmitted between said first network and said second network to enable a network connection to said first network."

It should be recognized that the teachings of Liu provide no such provision for creating different packet sizes for IP and 802.11, or for utilizing extra bytes available in the 802.11 network and not used in the TCP/IP network, or for piggybacking the data within the extra bytes of the 802.11 frames. Similarly, Liu teaches nothing in regard to enhancing the wireless communications and providing easy movement between IP and 802.11 transmissions according to the recited structure.

Therefore, because the teachings of Liu do not contain every element of independent Claim 30, Applicant respectfully requests that the rejection of Claim 30, and the claims that depend therefrom, be withdrawn.

(e) Claim 36. Independent Claim 36 has been amended in a similar manner to Claims 1, 2, 16, and 30 to describe a wireless network. The first and second networks comprise "a transport control protocol (TCP/IP)", and "an IEEE 802.11 wireless network", respectively. The optimization system limits retransmission of entire frames. And the retransmission of blocks is performed by "said retransmitted unrecoverable or corrupted blocks are piggybacked in a subsequent frame by using extra bytes space in the IEEE 802.11 frame which are not utilized in the IP frame."

It should be recognized that the teachings of Liu provide no such provision for creating different packet sizes for IP and 802.11, for utilizing extra bytes available in the 802.11 network that are not used in the TCP/IP network, or for piggybacking the data within the extra bytes of the 802.11 frames. Liu teaches nothing in regard to enhancing the wireless communications and allowing easy movement between IP and 802.11 transmissions according to the recited structure.

Therefore, because the teachings of Liu do not contain every element of independent Claim 36, Applicant respectfully requests that the rejection of Claim 36 and the claims that depend therefrom be withdrawn.

(f) Claims 3-7, 10-15, 25-29, 31-34, and 37-47. By virtue of the dependence of each of these claims from an independent claim whose novelty has been discussed above, each of these dependent claims should be considered *a fortiori* allowable. It should be appreciated, however, that a number of these claims provide additional grounds for patentability by reciting additional aspects of the process of partial packet retransmissions.

2. Claims 1-13, 16-27, 29-30, 33-36, 39, 41-45, and 47-49 are nonobvious.

Nor would the subject matter of Claims 1-13, 16-27, 29-30, 33-36, 39, 41-45, and 47-49 be obvious to a person having ordinary skill in the art in view of Liu or LoGalbo, singly or in combination. Neither reference cited by the Examiner, nor the combination thereof or in combination with is known in the art, either suggests, teaches, or provides motivation for optimizing data transfers as controlled from within said MAC layer by formatting network packets for IP transmission and then adding additional bytes for IEEE 802.11 transmission of FEC and checksums and performing partial packet retransmissions as recited in the Applicant's claims. Lui provides no such interoperable mechanisms, and neither does the LoGalbo reference discuss this mechanism.

In addition, LoGalbo presumes the use of TDMA type wireless medium, instead of CSMA/CA as found in IEEE 802.11 as in the claims of the instant application. One of ordinary skill in the art will appreciate that CSMA/CA does not use slots for transmission and is completely different from TDMA. For example in defining "CSMA/CA" the website www.wikipedia.org describes "CSMA/CA" as follows: "*CSMA/CA is used where CSMA/CD cannot be implemented due to the nature of the channel. CSMA/CA is used in 802.11 based wireless LANs. One of the problems of wireless LANs is that it is not possible to listen while sending, therefore collision detection is not possible.*" Thus, one of ordinary skill in the art will appreciate that the present invention operates utilizes

CSMA/CA and not in response to the slots used for transmission within a TDMA protocol.

Accordingly, the pending claims of the instant application recite structures and method steps which are patentable over the cited references for purposes of 35 U.S.C. § 103.

3. Rejection of Claims 8, 9, 17-24, and 35 under 35 U.S.C. § 103(a).

Claims 8, 9, 17-24, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al., U.S. Patent Number 6,934,257 (hereinafter Liu), as applied to claims 5, 16 and 34 above, and further in view of LoGalbo et al., U.S. Patent Number 6,947,446 (hereinafter LoGalbo).

First, it will be appreciated that these dependent claims should be considered a *fortiori* allowable in view of the demonstrated patentability of the parent claims. In the following discussion, Applicant addresses the issues brought up regarding the combination of Liu and LoGalbo.

In support of the rejection, the Examiner posits that Liu teaches all the limitations of Claims 5, 16, and 34, but goes on to say that Liu fails to teach checking each of the plurality of data blocks in the network packet frame using a forward error correction (FEC) information scheme attached to the network packet frame to determine whether a particular data block in the plurality of data blocks is correct or recoverable. The Examiner asserts that *"using a forward error correction (FEC) information scheme attached to a network packet frame to determine whether a particular data block in the plurality of data blocks is correct or recoverable is very well known in the art as taught for example by LoGalbo."*

Applicant acknowledges that FEC and checksums are a known mechanism for performing error correction. The claims of the instant application, however, are not directed to claiming FEC error correction *per se*, but to an apparatus and method which allows data compatibility between IP and 802.11, while utilizing additional bytes in 802.11 for error correction and partial retransmissions for which no teaching,

suggestion, or motivation is provided by the references or in what is known in the art.

Therefore, because the combination does not result in an apparatus having the elements recited in the claims, Applicant respectfully requests that the rejection of Claims 8, 9, 17-24, and 35 be withdrawn.

4. Cancellation of Claims 14-15, 28, 32, 37-38, and 46.

Claims 14-15, 28, 32, 37-38 and 46 were canceled in view of the amendments to the independent claims within the application.

5. Amendment of Claims 1-3, 16, 25, 29-31, 36, and 40.

Claims 1, 2, 16, 30, and 36. Independent Claims 1, 2, 16, 30, and 36 have been amended to recite the partial retransmission aspect with greater particularity.

The data packet transfers are recited as being TCP/IP transfers over an IEEE 802.11 network according to a preferred aspect of the present invention as described in the title of the invention and throughout the application for optimizing the IP transmissions over the IEEE 802.11 wireless connection. The additional partial retransmission aspects are described throughout the specification, including at least a portion of paragraph [0058], as follows. *"...The sender tries to transmit only unrecoverable or corrupted blocks and not to retransmit entire frames. The retransmitted blocks are piggybacked in the next frame by using the extra 800 bytes space in the IEEE 802.11 frame. In the partial retransmission scheme of the present invention, the number of frames used for retransmission will not be increased, since retransmitted blocks are piggybacked in subsequent frames. It should be appreciated that IEEE 802.11 standard wireless networks are subject to a substantially large amount of overhead for frame transmission in comparison with wired networks."*

It should also be noted that within Claims 1, 2, and 16 the phrase "and/or suppression of unnecessary packet acknowledgements" was removed from the claim language and its specific implementation subordinated to dependent claims. Claims 30 and 36 describe the integration of both (instead of "and/or" relationship) partial packet retransmission and ACK suppression within the claim.

Claims 3 and 31. Dependent Claims 3 and 31 have been amended to include details of ACK suppression which were previously recited in Claim 2. In addition, the amended claims recite deleting “a portion” of the unnecessary packet acknowledgments, as was recited in original Claim 16 and found in the specification, such as including paragraphs [0058], [0073]-[0074], and [0076].

Claim 25. Dependent Claim 25 has been amended to recite ACK suppression as originally recited in independent Claim 16, which is amended herein to describe “*deleting a portion of the transmit acknowledgments (ACKS)*”. Support is found in original Claim 16, as well as in the specification, such as in paragraphs [0058], [0073]-[0074], and [0076].

Claim 29. Dependent Claim 29 has been amended to correct claim dependency, consistent with the cancellation of Claim 28.

Claim 40. Dependent Claim 40 has been amended to recite specific frame structures of the IP protocol and the additional bytes utilized in IEEE 802.11 within which the partial retransmissions are performed while maintaining the original MTU. Support is found in original claims and the specification, including paragraph [0057].

6. Addition of Claims 48-49.

Dependent Claims 48-49 have been added to depend from independent Claim 1. Claim 48 describes more detail of partial packet retransmissions by using bytes not found in the MTU of the IP packets and piggybacking these within the IEEE 802.11 frame. Support for this aspect of the invention is found in the specification, including paragraphs [0057]-[0058] and [0084]. Claim 49 describes ACK suppression in which a portion of the ACKs are deleted, as recited in the original claims of the application.

It should be appreciated that Claim 48-49 should be considered *a fortiori* allowable in view of the discussion of parent Claim 1.

7. Amendments Made Without Prejudice or Estoppel.

Notwithstanding the amendments made and accompanying traversing remarks provided above, Applicant has made these amendments in order to expedite allowance

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of the currently pending subject matter. However, Applicant does not acquiesce in the original grounds for rejection with respect to the original form of these claims. These amendments have been made without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding these amendments. Applicant reserves the right to pursue the original scope of these claims in the future, such as through continuation practice, for example.

8. Conclusion.

Based on the foregoing, Applicant respectfully requests that the various grounds for rejection in the Office Action be reconsidered and withdrawn with respect to the presently amended form of the claims, and that a Notice of Allowance be issued for the present application to pass to issuance.

In the event any further matters remain at issue with respect to the present application, Applicant respectfully requests that the Examiner please contact the undersigned below at the telephone number indicated in order to discuss such matter prior to the next action on the merits of this application.

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Respectfully submitted,



John P. O'Banion, Reg. No. 33,201
M. Robyn Carrillo, Reg. No. 47,474
Rodger H. Rast, Reg. No. 45,853
O'BANION & RITCHEY LLP
400 Capitol Mall, Suite 1550
Sacramento, CA 95814
(916) 498-1010